

What is claimed is:

1. An inductor assembly comprising:  
  
at least one coil of insulated conductor material defining an inside volume,  
  
an inner core of magnetic core material located within the inside volume, and  
  
an outer core of magnetic core material including structure overlying the coil and inner core and having opposite inner walls facing polar ends of the coil and core such that at least two magnetic gaps exist between ends of the inner core and the opposite inner walls of the outer core.
2. The inductor assembly of claim 1 wherein the coil and the inner core have a flattened shape.
3. The inductor assembly of claim 1 wherein the outer core has a rectangular box shape.
4. The inductor assembly of claim 1 comprising a low-profile inductor wherein the outer core has a rectangular box shape and the coil and inner core have a flattened shape.
5. The inductor assembly of claim 1 wherein terminal ends of the coil of insulated conductor material have outwardly exposed flat contact surfaces to facilitate surface mounting of the inductor assembly to a printed circuit board or circuit substrate.
6. The inductor assembly of claim 5 wherein the exposed flat contact surfaces are coated with an antioxidant material not containing lead.
7. The inductor assembly of claim 1 wherein at least one end of the inner core has a recess defined to control inductive characteristic rolloff of the assembly as the inner core approaches core saturation.
8. The inductor assembly of claim 1 wherein the magnetic core material of the inner core and the outer core is selected from a group including MnZn, NiZn, MPP, Ni-Fe, Fe-Al-Si, amorphous alloys, iron, and iron powder.

9. The inductor assembly of claim 1 further comprising potting material for encapsulating the inner core and coil in position relative to the outer core to maintain the at least two magnetic gaps.

10. The inductor assembly of claim 1 further comprising adhesive for securing the inner core in position within the inside volume of the coil, and potting material for encapsulating the inner core and coil in position relative to the outer core to maintain the at least two magnetic gaps.

11. The inductor assembly of claim 1 comprising multiple coils thereby forming a transformer.

12. A method for constructing an inductor assembly comprising steps of:

forming at least one coil of insulated conductor material to define an inside volume,

forming an inner core from magnetic core material having a size and geometry adapted to be located within the inside volume,

securing the inner core in place within the inside volume to form a subassembly,

forming an outer core of magnetic core material to provide a structure overlying the coil and inner core and opposite inner walls facing polar ends of the coil and core, and

locating and securing the subassembly in the outer core between the opposite inner walls such that at least two magnetic gaps exist between ends of the inner core and the opposite inner walls of the outer core.

13. The method for constructing an inductor assembly set forth in claim 12 wherein the steps of securing the inner core in place within the inside volume and locating and securing the subassembly in the outer core result in said at least two magnetic gaps being of substantially equal length as determined along a longitudinal axis of the inner core and coil subassembly.

14. The method for constructing an inductor assembly set forth in claim 12 comprising a further step of preparing terminal ends of the coil for direct surface mount connection to a printed circuit board or circuit substrate.

15. The method for constructing an inductor assembly set forth in claim 14 wherein the step of preparing terminal ends comprises a step of defining flat faces having surfaces lying substantially within a single plane.

16. The method for constructing an inductor assembly set forth in claim 15 wherein the step of preparing terminal ends further includes a step of applying a lead-free antioxidant material to the flat faces.

17. The method for constructing an inductor assembly set forth in claim 15 wherein the step of preparing terminal ends further includes a step of tinning.

18. The method for constructing an inductor assembly set forth in claim 12 wherein the step of forming the inner core includes the step of defining a recess in an end of the inner core to control inductive characteristic rolloff of the assembly as the inner core approaches core saturation in use within an intended circuit environment.

19. The method for constructing an inductor assembly set forth in claim 12 wherein the steps of forming the inner core and forming the outer core are carried out by using magnetic core material selected from a group including MnZn, NiZn, MPP, Ni-Fe, Fe-Al-Si, amorphous alloys, iron, and iron powder.

20. The method for constructing an inductor assembly set forth in claim 12 wherein the step for forming the at least one coil comprises the step of forming plural coils so that the inductor assembly comprises a transformer.